Appendix E

Effect Of Senior Exemption on 2002 and 2004 Highway Mobile Source Emissions

Effect Of Senior Exemption on 2002 and 2004 Highway Mobile Source Emissions

During their 1996 session the Georgia General Assembly amended the Georgia Motor Vehicle Emission Inspection and Maintenance Act (O.C.G.A. Section 12-9, *et seq*), to exempt from emission testing those otherwise subject vehicles ten years old or older driven fewer than 5,000 miles per year and owned by persons 65 years old or older.

The actual numbers of vehicles which received senior citizen exemptions in 2002 are shown in the table below (source: Appendix I, Detailed List of Waivers Processed, from *2002 Annual Operations Report for Georgia's Enhanced Inspection and Maintenance Prgram*, MCI, July 30, 2003):

AGE	VEHICLES
10 years	1,629
11 years	2,120
12 years	2,239
13 years	2,630
14 years	2,496
15 years	2,350
16 years	2,369
17 years	2,227
18 years	1,708
19 years	1,111
20 years	669
21 years	586
22 years	496
23 years	833
24 years	794
25 years	44

2002 NO_x Credit Loss

MOBILE6.2 emission factors for calculating the 2002 NO_x credit loss from these exempted vehicles were determined in the following manner. Six combined highway mobile source control strategies were modeled:

- enhanced I/M in all 13 Atlanta ozone nonattainment area counties;
- the Federal Motor Vehicle Control Program, including Tier 1 and Tier 2 tailpipe standards;
- Stage II vapor recovery;
- low-sulfur (150 parts per million, or ppm) and low Reid Vapor Pressure (7.0 pounds per square inch, or psi) gasoline;
- the National Low Emission Vehicle (NLEV) program; and
- technician training and certification).

The enhanced I/M program is a decentralized annual hybrid with onboard diagnostics (OBD-II) system checks on 1996 and newer model year vehicles, two-mode ASM tests on 25-year-old through 1995 model year vehicles. Anti-tampering inspections (checking for catalyst removal) and gas cap pressure tests are performed on all vehicles subject to inspection.

- An overall 2002 highway mobile source NO_x inventory based on July 1, 2002, MOBILE6.2 emission factors with all controls in place (330,576,392 grams per day) was divided by the total projected summer-adjusted 2002 VMT (128,266,224 miles) with a resulting overall grams-per-mile NO_x emission factor of 2.577.

- MOBILE6.2 runs with all subject vehicles receiving their appropriate test were performed to determine the speed that would result in a July 1, 2002, NO_x emission factor of 2.577 grams per mile: 47.75 miles per hour.

- Two separate July 1, 2002, MOBILE6.2 runs, at 47.75 mph and with emissions calculated by model year, were made: one with hybrid I/M on 25-year-old and newer subject vehicles; the other with OBD-II system checks on 1996 and newer vehicles, with 1995 and older vehicles exempted.

- Next, both sets (covered and exempt) of emission factors were separately multiplied by the VMT fractions,[1] normalized to total 1.000, for the appropriate vehicle types (LDGV, LDGT12, LDGT34), and the three products were then added together to produce a single passenger vehicle emission factor for each exempted vehicle age.

- The differences in the covered and exempt emission factors were then determined for each exempted vehicle age, these differences were multiplied by 4999, the maximum allowable yearly miles traveled by exempt vehicles, and that product was then multiplied by the number of vehicles of that age to determine grams per year. Grams

[1] An output of MOBILE6.2, the VMT (vehicle miles traveled) fraction is the fraction of total VMT traveled by each vehicle type.

per year were converted to tons per day (907,180 grams per ton, 365 days per year) and the resulting **NO_x reduction credit loss for 2002 was determined to be 0.11 tons per day.**

2002 VOC Credit Loss

MOBILE6.2 emission factors for calculating the 2002 VOC credit loss from these exempted vehicles were determined in the following manner:

- An overall 2002 highway mobile source VOC inventory based on July 1, 2002, MOBILE6.2 emission factors with all controls in place (164,117,934 grams per day) was divided by the total projected 2002 VMT (128,266,224 miles) with a resulting overall grams-per-mile VOC emission factor of 1.280.

- MOBILE6.2 runs with all subject vehicles receiving their appropriate test were performed to determine the speed that would result in a July 1, 2002, VOC emission factor of 1.280 grams per mile: 27.4 miles per hour.

- Two separate July 1, 2002, MOBILE6.2 runs, at 27.4 mph and with emissions calculated by model year, were made: one with hybrid I/M on 25-year-old and newer subject vehicles; the other with OBD-II system checks on 1996 and newer vehicles, with 1995 and older vehicles exempted.

- Next, both sets (covered and exempt) of emission factors were separately multiplied by the VMT fractions, normalized to total 1.000, for the appropriate vehicle types (LDGV, LDGT12, LDGT34), and the three products were then added together to produce a single passenger vehicle emission factor for each exempted vehicle age.

- The differences in the covered and exempt emission factors were then determined for each exempted vehicle age, these differences were multiplied by 4999, the maximum allowable yearly miles traveled by exempt vehicles, and that product was then multiplied by the number of vehicles of that age to determine grams per year. Grams per year were converted to tons per day (907,180 grams per ton, 365 days per year) and the resulting **VOC reduction credit loss for 2002 was determined to be 0.39 tons per day.**

2004 NO_x Credit Loss

MOBILE6.2 emission factors for calculating the 2004 NO_x credit loss from these exempted vehicles were determined in the following manner. The same highway mobile source emission controls described above were modeled.

- An overall 2004 highway mobile source NO_x inventory based on July 1, 2004, MOBILE6.2 emission factors with all controls in place (288,619,317 grams per day)

was divided by the total projected summer-adjusted 2004 VMT (135,761,015 miles) with a resulting overall grams-per-mile NO_x emission factor of 2.126.

- MOBILE6.2 runs with all subject vehicles receiving their appropriate test were performed to determine the speed that would result in a July 1, 2004, NO_x emission factor of 2.126 grams per mile: 47.43 miles per hour.

- Two separate July 1, 2004, MOBILE6.2 runs, at 47.43 mph and with emissions calculated by model year, were made: one with hybrid I/M on 25-year-old and newer subject vehicles; the other with OBD-II system checks on 1996 and newer vehicles, with 1995 and older vehicles exempted.

- Next, both sets (covered and exempt) of emission factors were separately multiplied by the VMT fractions, normalized to total 1.000, for the appropriate vehicle types (LDGV, LDGT12, LDGT34), and the three products were then added together to produce a single passenger vehicle emission factor for each exempted vehicle age.

- The differences in the covered and exempt emission factors were then determined for each exempted vehicle age, these differences were multiplied by 4999, the maximum allowable yearly miles traveled by exempt vehicles, and that product was then multiplied by the number of vehicles of that age to determine grams per year. Grams per year were converted to tons per day (907,180 grams per ton, 365 days per year) and the resulting **NO_x reduction credit loss for 2004 was determined to be 0.09 tons per day.**

2004 VOC Credit Loss

Emission factors for calculating the 2004 VOC credit loss from these exempted vehicles were determined in the following manner:

- An overall 2004 highway mobile source VOC inventory based on July 1, 2004, MOBILE6.2 emission factors with all controls in place (145,656,821 grams per day) was divided by the total projected 2004 VMT (135,761,015 miles) with a resulting overall grams-per-mile VOC emission factor of 1.073.

- MOBILE6.2 runs with all subject vehicles receiving their appropriate test were performed to determine the speed that would result in a July 1, 2004, VOC emission factor of 1.073 grams per mile: 26.2 miles per hour.

- Two separate July 1, 2004, MOBILE6.2 runs, at 26.2 mph and with emissions calculated by model year, were made: one with hybrid I/M on 25-year-old and newer subject vehicles; the other with OBD-II system checks on 1996 and newer vehicles, with 1995 and older vehicles exempted.

- Next, both sets (covered and exempt) of emission factors were separately multiplied by the VMT fractions, normalized to total 1.000, for the appropriate vehicle types

(LDGV, LDGT12, LDGT34), and the three products were then added together to produce a single passenger vehicle emission factor for each exempted vehicle age.

- The differences in the covered and exempt emission factors were then determined for each exempted vehicle age, these differences were multiplied by 4999, the maximum allowable yearly miles traveled by exempt vehicles, and that product was then multiplied by the number of vehicles of that age to determine grams per year. Grams per year were converted to tons per day (907,180 grams per ton, 365 days per year) and the resulting **VOC reduction credit loss for 2004 was determined to be 0.24 tons per day.**

Detailed List of Waivers Processed

Wednesday, February 26, 2003

Report Data from 1/1/02 to 12/31/02 11:59:59 PM

Model Year	Grand Total	Repair	Senior Exemptions	Extentions				Canadian (non-OBD compliant)	Grandfathered		Reciprocal
				Military	Student	Business	Manager Authorized		W/O Cat	With Cat	
1975	5		5								
1976	6		6								
1977	46		44			2					
1978	829	6	794	1	4	20	2		1		1
1979	879	14	833	1	1	20			4		2
1980	523	5	496		1	8	1		3	7	1
1981	623	6	586	2	3	19	3		2	2	
1982	712	14	669			22	2		5		
1983	1,189	22	1,111	4	6	30	1		7	5	1
1984	1,824	34	1,708	3	7	53	4		1	10	4
1985	2,392	44	2,227	5	11	76	9		4	8	7
1986	2,517	46	2,369	5	23	61	6			1	5
1987	2,536	52	2,350	12	25	85	4		1		5
1988	2,713	68	2,496	7	39	85	5		1		9
1989	2,871	56	2,630	12	56	100	8		2		4
1990	2,493	39	2,239	18	91	96	3				6
1991	2,487	78	2,120	23	109	133	15				7
1992	2,024	65	1,629	31	129	148	11				8
1993	478	61	36	30	133	193	11				12
1994	555	55	4	58	201	216	9				9
1995	630	47	4	62	254	245	10				6
1996	1,471	216	2	51	243	588	366				2
1997	1,236	135	1	68	260	551	217				4
1998	1,046	59	5	59	236	486	199				
1999	1,163	15	5	67	240	566	265			2	3
2000	32				3	4	25				
2001	2		1				1				
2002	1					1					
Totals:	**33,283**	**1,137**	**24,370**	**519**	**2,075**	**3,808**	**1,177**		**31**	**35**	**96**